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■

PHOSPHATE FERTILIZER INDUSTRY

Proposed Performance Standards for New Stationary Sources

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 60]

[FRL 278–5]

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Five Categories of Sources in the Phosphate Fertilizer Industry

Pursuant to section 111 of the Clean Air Act, as amended, the Administrator proposes herein standards of performance for new affected facilities for five categories of sources within the phosphate fertilizer industry as follows: wet-process phosphoric acid plants, superphosphoric acid plants, diammonium phosphate plants, triple superphosphate plants, and granular triple superphosphate storage facilities.

On December 23, 1971 (36 FR 24876), the first standards of performance were promulgated for five categories of sources. On March 8, 1974 (39 FR 9308), standards of performance were promulgated for seven additional categories of sources. Since that time, several other publications in the FEDERAL REGISTER have amended the standards.

As prescribed by section 111, proposal of standards within the phosphate fertilizer industry was preceded by the Administrator's determination that these categories of sources contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare and by publication of this determination elsewhere in this issue of the FEDERAL REGISTER.

The phosphate fertilizer industry is a major source of fluoride air pollution. Fluoride was the only pollutant, other than the criteria pollutants, specifically named as requiring Federal action in the March, 1970, "Report of the Secretary of Health, Education and Welfare to the United States (91st) Congress." This report concluded that "inorganic fluorides are highly irritant and toxic gases" which, in low ambient concentrations, damage plants and animals. The United States Senate Committee on Public Works in its report on the Clean Air Amendments of 1970 (Senate Report No. 91–1196, September 17, 1970, p. 9) included fluorides on a list of contaminants which have broad national impact and require Federal action.

Even though present evidence indicates that fluorides in the range of ambient concentrations encountered under worst conditions do not damage human health through inhalation, they do present a serious threat to public welfare. Extensive documented evidence is available describing the injurious effects of fluorides on vegetation and herbivorous animals which have consumed vegetation that contains fluorides. Public welfare is affected not only through the aesthetic impact of fluoride on vegetation, but also through a decrease in the economic value of sensitive crops which are overtly damaged by exposure to fluorides in the atmosphere.

With the need for control of fluoride so obvious, an evaluation was made of available alternative avenues of regulatory control. The "Preferred Standards Path Report for Fluorides" (November 1972) concluded that the most appropriate strategy is through the authority of section 111 of the Act. This, in turn, invokes section 111(d) which provides for a regulatory mechanism to assure a nationwide strategy for control of any air pollutants which are not on lists published pursuant to section 108(a) or 112(b)(1)(A) of the Act. Fluoride has not been named on either list. Specifically, section 111(d) requires that the Administrator prescribe a procedure to assure the subsequent development, implementation and enforcement of emission standards for existing sources that would be subject to the standard of performance if they were new sources.

As a consequence of the provisions of section 111(d), final promulgation of this standard of performance for new sources will require that the States develop emission standards for existing plants within the five categories of sources. Actions to implement section 111(d) will be initiated after promulgation of this regulation.

The standards for new sources will require installation of high efficiency gas scrubbers. Such scrubbers (with internal packing to improve the absorption efficiency of the scrubbing fluid) are commonly used on all the categories of sources except superphosphoric acid (SPA). However, based on data from the other categories, engineering judgment indicates the standard recommended for SPA plants is achievable with the same type of equipment.

The standard will permit construction of both of the more common processes for manufacture of SPA even though one also emits pollutants other than fluorides (i.e., SO_2 and hydrocarbons). Although the vacuum evaporation SPA process is intrinsically superior from an air pollution control aspect, it is unable to concentrate acid made from poor quality rock because of the inherent contamination of that rock. If the industry is restricted to the vacuum evaporation process, it would be unable to utilize the nation's increasingly poorer quality phosphate rock. This would increase costs and decrease the competitive position of the domestic industry. In the judgment of the Administrator, the adverse aspects of a more stringent standard that would disfranchise the direct contact system outweigh the incremental improvement in air pollution control.

Visible emission standards are proposed for diammonium phosphate plants, triple superphosphate plants, and granular triple superphosphate storage facilities. The effluent gas streams from these processes include particulate matter (both fluoride and non-fluoride), as well as gaseous fluoride. The control systems that must be installed to comply with the proposed standard for total fluorides remove particulate matter along with gaseous fluorides. Improper operation and maintenance of such control systems result in an increase in emissions of total fluorides as well as particulate matter, the increase in particulate matter resulting in an increase in the opacity of the gas stream. Available information indicates that a control system which meets the proposed limit for total fluorides will easily meet the proposed limit for opacity. However, a control system which does not meet the proposed limit for opacity will clearly not meet the proposed limit for total fluorides.

Visible emission standards are not proposed for wet-process phosphoric acid plants or superphosphoric acid plants. Effluent gas streams from wet-process phosphoric acid plants contain very little particulate matter; therefore, a visible emission standard would not indicate improper operation and maintenance of a control system. Sufficient data are not available for superphosphoric acid plants equipped with best available control technology to develop an appropriate visible emission standard.

The proper use of and test methods for opacity standards are presently being reconsidered by the Agency in response to remands from the United States Court of Appeals for the District of Columbia Circuit in Portland Cement Association v. Ruckelshaus, 486 F.2d 375 (1973), and Essex Chemical Corp. v. Ruckelshaus, 486 F.2d 427 (1973). The response to the remand in the Portland Cement case should be completed shortly. At that time, the Agency will promulgate or propose such revisions of its opacity standards or test methods as it deems necessary or desirable. In accordance with section 117(f) of the Act, publication of these proposed amendments to 40 CFR was preceded by consultation with appropriate advisory committees, independent experts and Federal departments and agencies. In the course of these consulations, the Department of Commerce has questioned the establishment of visible emisions (opacity) standards. The Department of Commerce believes that opacity limits have not been satisfactorily correlated to give rates of particulate concentration emissions or mass emissions to establish opacity as a standard. Further, Commerce has questioned whether such standards would be subject to accurate visual determination. Commerce, therefore, recommended that opacity limits not be adopted as a standard where a particulate concentration or mass emissions standard is established. Commerce believes such opacity limits should only be used in those cases to create a rebuttable presumption of a violation of the particulate or mass emissions standards. Commerce believes such presumption could, for example, be rebutted by providing a continuous opacity monitor record showing a visual opacity observation to be in error; and/or by a showing that the particulate concentration or mass emissions standards was not exceeded at the time the opacity limit was exceeded. Commerce believes such a showing could be made by a performance

test. If the owner or operator wished to use such test to show that he was not in violation of the mass or concentration standard at the time the opacity limit was exceeded, he must be able to establish the critical plant and control operating parameters that existed at the time of the observed opacity violation by a system of continuous monitoring and recording of such data so that such conditions can be duplicated at the time of the test.

EPA does not support the approach suggested by the Department of Commerce and is proposing opacity standards in the regulation. EPA believes that the opacity concept is both technically sound and the most practical and inexpensive way to insure that control equipment is adequately maintained and operated between performance tests. A performance test conducted after a source was observed to be in violation of the opacity standard would not in EPA's opinion necessarily resolve the question whether, at the time of the observed violation, the source was meeting the concentration standard. During the period between the observed violation of the opacity standard and the time of the performance test, the owner or operator in some cases could take remedial action to bring a non-complying source into compliance. EPA's opinion is that the only way to resolve this problem would be through use of a continuous monitoring system or through performance tests conducted at such frequent intervals as to yield similar results. EPA believes the approach suggested by the Department of Commerce is not a realistic or practial alternative in the absence of an appropriate continuous monitoring system. However at the request of the Department of Commerce, EPA is submitting for public comment that agency's recommendation and will consider any comments of State officials, industrial representatives, environmentalists, and the general public on this or any other alternative approach.

The bases for the proposed standards include the results of measurements of emissions conducted by industry, the Environmental Protection Agency and local agencies; data derived from available technical literature; information gathered during visits to pollution control agencies and plants in the United States; and comments and suggestions solicited from experts. The proposed standard reflects the degree of emission limitation achievable through the application of the best system of emission reduction which, taking into account the cost of achieving such reduction, the Administrator has determined to have been adequately demonstrated. "Background Information for Standards of Performance: Phosphate Fertilizer Industry," which presents the results of emission measurements and other factors considered in arriving at the proposed standards, including the types of control systems and their costs, is available free of charge from the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, attention: Mr. Don R. Goodwin. It is emphasized that the costs of control are considered reasonable for new and modified sources. It is not implied that the same costs apply to the retrofitting of existing sources. Retrofitting to achieve the proposed emission limitations would in some cases cost much more.

The possible adverse environmental impact resulting from the proposed standards has been considered and determined negligible. With present technology, each phosphate fertilizer complex has a holding pond into which the waste process water and by-product calcium sulfate (gypsum) are deposited. Water from this pond is used to scrub fluoride from the exhaust gas streams. The water, containing captured fluoride, is returned to the pond where part of the fluoride combines with the calcium salts and precipitates. The incremental solid waste discharged from the air pollution control system is insignificant in comparison to the gypsum waste which results from normal process operations. Although some of the fluoride in the water escapes to the air, long-term efforts by the industry to quantify these losses, either directly or through the stoichiometry of the aqueous reactions, have been unsuccessful.

For three of the five standards there will be no increase in power consumption over that which results from State and local standards. Industrywide, the average increase in power consumption for both wet process phosphoric acid and diammonium phosphate will be less than 0.5 kilowatt-hour per ton of P_2O_5 produced.

An extensive investigation of the probable economic impact of standards of performance on the domestic industry was performed. In general, it reveals the outlook for the industry is optimistic. The projected growth in demand for phosphate products averages about five percent. The industry is healthy with a capacity utilization of over 90 percent and a steady upward trend in prices and profits since 1969. The costs of control (in states where no regulations exist) to meet standards of performance will be about one percent of sales for triple superphosphate and one-half percent for diammonium phosphate and most other products. (The existing laws in Florida are already sufficiently stringent that these standards will have little or no effect on production costs.) The optimistic outlook and small costs would suggest that increased production costs due to standards of performance should not restrict growth in the industry. The disparity in cost between triple superphosphate and diammonium phosphate will only hasten an existing trend toward production of diammonium phosphate.

Standards of performance for new stationary sources sometimes result in a more severe economic impact for smaller firms primarily because economies of scale generally favor larger installations. Since the Small Business Administration defines a small phosphate fertilizer firm as one which has fewer than 500 employees, there are five corporate entities (out of a total thirty-three) that would be classified as small businesses.

The small business enterprise is likely to build smaller sized facilities which produce both phosphoric acid and diammonium phosphate or a large plant which produces only diammonium phosphate. For such operations, control costs may be expected to be somewhat higher than those cited above because of economies of scale. Still, the costs are not considered sufficiently large to bar entry or expansion of the small business.

In accordance with section 117(f) of the Act, publication of these proposed amendments to 40 CFR Part 60 was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies. Interested persons may participate in this rulemaking by submitting written comments (in triplicate) to the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, attention: Mr. Don R. Goodwin. The Administrator will welcome comments on all aspects of the proposed regulations, including economic and technological issues. All relevant comments received on or before December 6, 1974, will be considered. Comments received will be available for public inspection at the Office of Public Affairs, 401 M Street SW., Washington, D.C. 20460.

This notice of proposed rulemaking is issued under the authority of sections 111 and 114 of the Clean Air Act, as amended (42 U.S.C. 1857c–6 and 9).

Dated: October 11, 1974.

JOHN QUARLES,
Acting Administrator.

It is proposed to amend Part 60 of Chapter I of Title 40 of the Code of Federal Regulations, by adding new subparts T, U, V, W, and X as follows:

Subpart T—Standards of Performance for the Phosphate Fertilizer Industry: Wet Process Phosphoric Acid Plants

Sec.

60.200 Applicability and designation of affected facility.
60.201 Definitions.
60.202 Standard for fluorides.
60.203 Monitoring of operations.
60.204 Test methods and procedures.

Subpart U—Standards of Performance for the Phosphate Fertilizer Industry: Superphosphoric Acid Plants

60.210 Applicability and designation of affected facility.
60.211 Definitions.
60.212 Standard for fluorides.
60.213 Monitoring of operations.
60.214 Test methods and procedures.

Subpart V—Standards of Performance for the Phosphate Fertilizer Industry: Diammonium Phosphate Plants

60.220 Applicability and designation of affected facility.
60.221 Definitions.
60.222 Standard for fluorides.
60.223 Standard for visible emissions.
60.224 Monitoring of operations.
60.225 Test methods and procedures.

Subpart W—Standards of Performance for the Phosphate Fertilizer Industry: Triple Superphosphate Plants

Sec.

60.230 Applicability and designation of affected facility.
60.231 Definitions.
60.232 Standard for fluorides.
60.233 Standard for visible emissions.
60.234 Monitoring of operations.
60.235 Test methods and procedures.

Subpart X—Standards of Performance for the Phosphate Fertilizer Industry: Granular Triple Superphosphate Storage Facilities

60.240 Applicability and designation of affected facility.
60.241 Definitions.
60.242 Standard for fluorides.
60.243 Standard for visible emissions.
60.244 Monitoring of operations.
60.245 Test methods and procedures.

AUTHORITY: Secs. 111, 114, Pub. L. 91-604 (42 U.S.C. 1857c-6 and 9).

Subpart T—Standards of Performance for the Phosphate Fertilizer Industry: Wet-Process Phosphoric Acid Plants

§ 60.200 Applicability and designation of affected facility.

The affected facility to which the provisions of this subpart apply is each wet-process phosphoric acid plant. For the purpose of this subpart, the affected facility is one or any combination of: reactors, filters, evaporators, and hotwells.

§ 60.201 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Wet-process phosphoric acid plant" means any facility manufacturing phosphoric acid by reacting phosphate rock and acid.

(b) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.204.

(c) "Equivalent P_2O_5 feed" means the quantity of phosphorus, expressed as phosphorous pentoxide, fed to the process.

§ 60.202 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 10 g/metric ton of equivalent P_2O_5 feed (0.020 lb/ton).

§ 60.203 Monitoring of operations.

(a) The owner or operator of any wet-process phosphoric acid plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a flow measuring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The flow measuring device shall have an accuracy of ±5 percent over its operating range.

(b) The owner or operator of any wet-process phosphoric acid plant shall maintain a daily record of equivalent P_2O_5 feed as determined by § 60.204(d).

§ 60.204 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided in § 60.8 (b), shall be used to determine compliance with the standard prescribed in § 60.202 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A or 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Equivalent P_2O_5 feed shall be determined as follows:

(1) Determine the total mass rate in metric ton/hr of phosphorus-bearing feed during each run using a flow measuring device meeting the requirements of § 60.203(a).

(2) Calculate the equivalent P_2O_5 feed by multiplying the percentage P_2O_5 content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass rate of phosphorus-bearing feed. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11–12. Other methods may be approved by the Administrator.

(e) For each run, emissions expressed in g/metric ton of equivalent P_2O_5 feed shall be determined using the following equation:

$$E = \frac{(C_s Q_s)\,10^{-3}}{M_{P_2O_5}}$$

where:

E = emissions of total fluorides in g/metric ton of equivalent P_2O_5 feed.

C_s = concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

Q_s = volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10^{-3} = conversion factor for mg to g.

$M_{P_2O_5}$ = equivalent P_2O_5 feed in metric ton/hr as determined by §60.204(d).

Subpart U—Standards of Performance for the Phosphate Fertilizer Industry; Superphosphoric Acid Plants

§ 60.210 Applicability and designation of affected facility.

The affected facility to which the provisions of this subpart apply is each superphosphoric acid plant. For the purpose of this subpart, the affected facility is one or any combination of: evaporators, hotwells, acid sumps, and cooling tanks.

§ 60.211 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Superphosphoric acid plant" means any facility which concentrates wet-process phosphoric acid to 60 percent or greater P_2O_5 content by weight for eventual consumption as a fertilizer.

(b) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.214.

(c) "Equivalent P_2O_5 feed" means the quantity of phosphorus, expressed as phosphorous pentoxide, fed to the process.

§ 60.212 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 5.0 g/metric ton of equivalent P_2O_5 feed (0.010 lb/ton).

§ 60.213 Monitoring of operations.

(a) The owner or operator of any superphosphoric acid plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a flow measuring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The flow measuring shall have an accuracy of ±5 percent over its operating range.

(b) The owner or operator of any superphosphoric acid plant shall maintain a daily record of equivalent P_2O_5 feed as determined by § 60.214(d).

§ 60.214 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided in § 60.8(b), shall be used to determine compliance with the standard prescribed in § 60.212 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A or 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be at least 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Equivalent P_2O_5 feed shall be determined as follows:

(1) Determine the total mass rate in metric ton/hr of phosphorus-bearing feed during each run using a flow measuring device meeting the requirements of § 60.213(a).

(2) Calculate the equivalent P_2O_5 feed by multiplying the percentage P_2O_5 content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass rate of phosphorus-bearing feed. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11–12. Other methods may be approved by the Administrator.

(e) For each run, emissions expressed in g/metric ton of equivalent P_2O_5 feed, shall be determined using the following equation:

$$E=\frac{(C_s Q_s)\,10^{-3}}{M_{P_2O_5}}$$

where:

E = emissions of total fluorides in g/metric ton of equivalent P_2O_5 feed.

C_s = concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

Q_s = volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10^{-3} = conversion factor for mg to g.

$M_{P_2O_5}$ = equivalent P_2O_5 feed in metric ton/hr as determined by §60.214(d).

Subpart V—Standards of Performance for the Phosphate Fertilizer Industry: Diammonium Phosphate Plants

§ 60.220 Applicability and designation of affected facility.

The affected facility to which the provisions of this subpart apply is each diammonium phosphate plant. For the purpose of this subpart, the affected facility is one or any combination of: reactors, granulators, dryers, coolers, screens and mills.

§ 60.221 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Diammonium phosphate plant" means any plant manufacturing diammonium phosphate by reacting phosphoric acid with ammonia.

(b) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.225.

(c) "Equivalent P_2O_5 feed" means the quantity of phosphorus, expressed as phosphorus pentoxide, fed to the process.

§ 60.222 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 30g/metric ton of equivalent P_2O_5 feed (0.060 lb/ton).

§ 60.223 Standard for visible emissions.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which exhibit 20 percent opacity or greater.

§ 60.224 Monitoring of operations.

(a) The owner or operator of any diammonium phosphate plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a flow measuring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The flow measuring device shall have an accuracy of ±5 percent over its operating range.

(b) The owner or operator of any diammonium phosphate plant shall maintain a daily record of equivalent P_2O_5 feed, as determined by § 60.225(d).

§ 60.225 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided for in § 60.8(b), shall be used to determine compliance with the standard prescribed in § 60.222 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A and 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be at least 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Equivalent P_2O_5 feed shall be determined as follows:

(1) Determine the total mass rate in metric ton/hr of phosphorus-bearing feed during each run using a flow measuring device meeting the requirements of § 60.224(a).

(2) Calculate the equivalent P_2O_5 feed by multiplying the percentage P_2O_5 content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass rate of phosphorus-bearing feed. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11–12. Other methods may be approved by the Administrator.

(e) For each run, emissions expressed in g/metric ton of equivalent P_2O_5 feed shall be determined using the following equation:

$$E=\frac{(C_s Q_s)\,10^{-3}}{M_{P_2O_5}}$$

where:

E = emissions of total fluorides in g/metric ton of equivalent P_2O_5

C_s = concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

Q_s = volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10^{-3} = conversion factor for mg to g.

$M_{P_2O_5}$ = equivalent P_2O_5 feed in metric ton/hr as determined by §60.225(d).

Subpart W—Standards of Performance for the Phosphate Fertilizer Industry: Triple Superphosphate Plants

§ 60.230 Applicability and designation of affected facility.

The affected facility to which the provisions of this subpart apply is each triple superphosphate plant. For the purpose of this subpart, the affected facility is one or any combination of: mixers, curing belts (dens), reactors, granulators, dryers, coolers, screens, mills and facilities which store run-of-pile triple superphosphate.

§ 60.231 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Triple superphosphate plant" means any facility manufacturing triple superphosphate by reacting phosphate rock with phosphoric acid. A run-of-pile triple superphosphate plant includes curing and storing.

(b) "Run-of-pile triple superphosphate" means any triple superphosphate that has not been processed in a granulator and is composed of particles at least 25 percent of which (when not caked) will pass through a 16 mesh screen.

(c) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.235.

(d) "Equivalent P_2O_5 feed" means the quantity of phosphorus, expressed as phosphorus pentoxide, fed to the process.

§ 60.232 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 100 g/metric ton of equivalent P_2O_5 feed (0.20 lb/ton).

§ 60.233 Standard for visible emissions.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected

facility any gases which exhibit 20 percent opacity or greater.

§ 60.234 Monitoring of operations.

(a) The owner or operator of any triple superphosphate plant subject to the provisions of this subpart shall install, calibrate, maintain, and operate a flow measuring device which can be used to determine the mass flow of phosphorus-bearing feed material to the process. The flow measuring device shall have an accuracy of ±5 percent over its operating range.

(b) The owner or operator of any triple superphosphate plant shall maintain a daily record of equivalent P_2O_5 feed, as determined by § 60.235(d).

§ 60.235 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided for in § 60.8(b), shall be used to determine compliance with the standard prescribed in § 60.232 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A or 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be at least 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Equivalent P_2O_5 feed shall be determined as follows:

(1) Determine the total mass rate in metric ton/hr of phosphorus-bearing feed during each run using a flow measuring device meeting the requirements of § 60.234(a).

(2) Calculate the equivalent P_2O_5 feed by multiplying the percentage P_2O_5 content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass rate of phosphorus-bearing feed. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11–12. Other methods may be approved by the Administrator.

(e) For each run, emissions expressed in g/metric ton of equivalent P_2O_5 feed shall be determined using the following equation:

where:

$$E=\frac{(C_s Q_s)\,10^{-3}}{M_{P_2O_5}}$$

E = emissions of total fluorides in g/metric ton of equivalent P_2O_5 feed.

C_s = concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

Q_s = volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10^{-3} = conversion factor for mg to g.

$M_{P_2O_5}$ = equivalent P_2O_5 feed in metric ton/hr as determined by §60.235(d).

Subpart X—Standards of Performance for the Phosphate Fertilizer Industry: Granular Triple Superphosphate Storage Facilities

§ 60.240 Applicability and designation of affected facility.

The affected facility to which the provisions of this subpart apply is each granular triple superphosphate storage facility. For the purpose of this subpart, the affected facility is one or any combination of: storage or curing piles, conveyors, elevators, screens and mills.

§ 60.241 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Granular triple superphosphate storage facility" means any facility curing or storing granular triple superphosphate.

(b) "Total fluorides" means elemental fluorine and all fluoride compounds as measured by reference methods specified in § 60.245.

(c) "Equivalent P_2O_5 stored" means the quantity of phosphorus, expressed as phosphorus pentoxide, being cured or stored in the affected facility.

(d) "Fresh granular triple superphosphate" means granular triple superphosphate produced no more than 10 days prior to the date of the performance test.

§ 60.242 Standard for fluorides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain total fluorides in excess of 0.25 g/hr/metric ton of equivalent P_2O_5 stored (5.0×10^{-4} lb/hr/ton of equivalent P_2O_5 stored).

§ 60.243 Standard for visible emissions.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which exhibit 20 percent opacity or greater.

§ 60.244 Monitoring of operations.

(a) The owner or operator of any granular triple superphosphate storage facility subject to the provisions of this subpart shall maintain an accurate account of triple superphosphate in storage to permit the determination of the amount of equivalent P_2O_5 stored.

(b) The owner or operator of any granular triple superphosphate storage facility shall maintain a daily record of total equivalent P_2O_5 stored by multiplying the percentage P_2O_5 content, as determined by § 60.245(f)(2), times the total mass of granular triple superphosphate stored.

§ 60.245 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided for in § 60.8(b), shall be used to determine compliance with the standard prescribed in § 60.242 as follows:

(1) Method 13A or 13B for the concentration of total fluorides and the associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for velocity and volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 13A or 13B, the sampling time for each run shall be at least 60 minutes and the minimum sample volume shall be at least 0.85 dscm (30 dscf) except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) The air pollution control system for the affected facility shall be constructed so that volumetric flow rates and total fluoride emissions can be accurately determined by applicable test methods and procedures.

(d) Except as provided under paragraph (e) of this section, all performance tests on granular triple superphosphate storage facilities shall be conducted only when the following quantities of product are being cured or stored in the facility:

(1) Total granular triple superphosphate—at least 10 percent of the building capacity.

(2) Fresh granular triple superphosphate—at least 20 percent of the amount of triple superphosphate in the building.

(e) If the provisions set forth in paragraph (d)(2) of this section exceed production capabilities for fresh granular triple superphosphate, the owner or operator shall have at least five days maximum production of fresh granular triple superphosphate in the building during a performance test.

(f) Equivalent P_2O_5 stored shall be determined as follows:

(1) Determine the total mass stored during each run using an accountability system meeting the requirements of § 60.244(a).

(2) Calculate the equivalent P_2O_5 stored by multiplying the percentage P_2O_5 content, as measured by the spectrophotometric molybdovanadophosphate method (AOAC Method 9), times the total mass stored. AOAC Method 9 is published in the Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11–12. Other methods may be approved by the Administrator.

(g) For each run, emissions expressed in g/hr/metric ton of equivalent P_2O_5 stored shall be determined using the following equation:

$$E = \frac{(C_s Q_s)\, 10^{-3}}{M_{P_2O_5}}$$

where:

E = emissions of total fluorides in g/hr/metric ton of equivalent P_2O_5 feed.

C_s = concentration of total fluorides in mg/dscm as determined by Method 13A or 13B.

Q_s = volumetric flow rate of the effluent gas stream in dscm/hr as determined by Method 2.

10^{-3} = conversion factor for mg to g.

$M_{P_2O_5}$ = equivalent P_2O_5 stored in metric ton as measured by §60.245(d).

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